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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,720	09/22/2003	Arie Jeffrey Den Boef	081468-0306010	4652

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EXAMINER	
LE, QUE TAN	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 11/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/665,720	DEN BOEF ET AL.	
	Examiner	Art Unit	
	Que T. Le	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-68* is/are pending in the application.

4a) Of the above claim(s) *62 and 63* is/are withdrawn from consideration.

5)☒ Claim(s) *8-45,47-49 and 64-68* is/are allowed.

6)☒ Claim(s) *1-7,46 and 50-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This is in response to Applicants' reply to restriction requirement filed October 18, 2005.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-61 and 64-68, drawn to a device inspection apparatus and its method including a first and second marker position measurements and a metrology unit comparing the measurements, classified in class 250, subclass 221.

II. Claims 62 and 63, drawn to a metrology unit including a translatable carrier and a detector array for detecting diffracted light, classified in class 250, subclass 216.

The inventions are distinct, each from the other because:

Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, each of the inventions I and II has separate utility such as stated above. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Applicant's election with traverse of Group I, claims 1-61 and 64-68 in the reply filed on October 18, 2005 is acknowledged. The traversal is on the ground(s) that the search and examination of the both different invention, group I and II, can be made without a serious burden and the search and examination for the invention group I necessarily encompasses the search and examination for the invention group II. This is not found persuasive because the search and examination of plural different inventions at once is a serious burden for the examiner and the search and examination for one group of the invention is not encompasses the search for another because of their recognized divergent subject matter as set forth above.

The requirement is still deemed proper and is therefore made FINAL.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The disclosure is objected to because of the following informalities: In claim 8, the colon ":" on line 6 should be deleted. In claim 24, "iv" on line 2 should be changed to "in". In claim 45, the period "." on line 6 should be changed to a comma "," and "And" should be changed to "and".

Appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 46 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The further citation and the dependency of claim 46 are vague because the claim being depended on "any of claims 24"(?) and also being dependent upon claim 42. The intended scope of the claimed invention is unclear. Clarification and correction are required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 5-7, 50, 53, 56, 60 and 61 are rejected under 35 U.S.C. 102(b) as being anticipated by Wessner et al 5,047,651.

Wessner et al disclose an optical system comprising: a light source (2) to direct light at an asymmetric marker (17, 29) having a plurality of diffraction grating tracks provided on a device (1); a detector (1, 31) to detect diffracted light reflected from the marker with a particular diffraction angle and to provide a measurement (deviation of marking tracks) of the position of the marker; a second detector (1, 31) to detect diffracted light reflected from the marker with different diffraction angle and to provide a second measurement of the position of the marker; and a metrology unit or computing unit (10, 11) to compare the measured positions to provide a different signal (D) indicative of the deviation of the marking tracks or the degree of asymmetry of the marker. The diffraction grating tracks include a plural phase diffraction gratings (Figures 1-8). The system of Wessner et al inherently performs the claimed method steps.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 4, 51, 52, 54, 55 and 57-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wessner et al 5,047,651.

With respect to claims 3 and 4, although Wessner et al disclose phase diffraction gratings for providing phase different signals with different diffraction angles (Figures 1, 2 4, 5, 7 and 8) wherein the grating frequency of each diffraction grating determines a

respective diffraction angle but fail to specify whether or not the diffracted light including different wavelengths, it would have been inherently included, however, if not, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wessner et al accordingly in order to provide a more accurate detection/inspection result from the system.

With respect to claims 57-59, although Wessner et al lack a clear inclusion of the system being used and/or located within a lithographic projection system, the use of an alignment and/or position inspection device in a lithographic projection system for providing accurate positional relationship between elements/components of the system would have been obvious to one of ordinary skill in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wessner et al accordingly in order to provide a more reliable projection performance of the system. The selection of a specific location and/or position of the position inspection in related to the lithographic system would have been obvious to one of ordinary skill in the art in order to provide a more compact design for the system. The proposed system of Wessner et al inherently performs the claimed method steps. The specific timing and/or the manner for providing marker on the device, as claimed in claims 51, 52, 54 and 55, would have been obvious for similar reasons set forth above.

Claim 46 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Claims 8-45, 47-49 and 64-68 are allowable over the prior art of record because the prior art fails to teach a method of forming and/or operation of device inspection, among other features, comprising: providing an asymmetric marker having at least a first diffraction grating in a first layer of the device, at least a second diffraction grating in a second layer of the device, wherein the asymmetry of the marker being dependent on an overlay of the layers; obtaining measurements of the position of the marker via detection of diffracted light with particular wavelength or angle; and comparing the measured positions to determine a shift indicative at least one of degree of asymmetry of the marker, the overlay of the layers, the focus error of a lithographic projection system, the critical dimension of the lithographic projection system and the effect of processing on the marker.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Que T. Le whose telephone number is (571) 272-2438.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta, can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Que T. Le